DOCUMENT RESUME

ED 258 957 SP 026 416

AUTHOR Galambos, Eva C.
TITLE Teacher Preparation: The Anatomy of a College Degree.
INSTITUTION Southern Regional Education Board, Atlanta, Ga.
SPONS AGENCY National Endowment for the Humanities (NFAH), Washington, D.C.
PUB DATE [85]
NOTE 39p.
AVAILABLE FROM Southern Regional Education Board, 1340 Spring Street N.W., Atlanta, GA 30309 ($3.50).
PUB TYPE Reports - Research/Technical (143)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS College Credits; *Course Content; Education Courses; *Education Majors; Elective Courses; *General Education; Higher Education; *Preservice Teacher Education; *Required Courses; *Teacher Education Curriculum
IDENTIFIERS *Teacher Candidates; United States (South)

ABSTRACT

To document how future teachers are being educated, over 3,000 transcripts of future teachers in 14 southern states were examined, course by course. Information was sought on: (1) What courses are future teachers taking in college? (2) Do teachers take different academic courses than other students? (3) Does the general education in the first two years lay the necessary foundation for specialization and education courses? (4) What is the division of coursework between the "content" that teachers will teach, and the "methods" on how they will present the "content"; and (5) How relevant are the areas of specialization of the secondary teachers to assignments they are likely to draw in typical high schools? Chapter 1 of this monograph presents an overview of the findings. Implications of these results for strengthening teacher education programs are discussed in Chapter 2. The statistical data concerning the general education of teachers, with comparisons to arts and sciences graduates are presented in Chapter 3, followed by an outline of the statistical findings about the academic majors (Chapter 4) and the education courses teachers complete (Chapter 5). The last chapter provides some descriptive impressions about the quality of some of the courses offered. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED258957

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

M.A. Sullivan

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

SP026416

Teacher Preparation: The Anatomy of a College Degree

Southern Regional Education Board

Teacher Preparation: The Anatomy of a College Degree

Eva C. Galambos

1340 Spring Street, N.W. • Atlanta, Georgia 30309 • 1985 • $3.50

SREB

Southern Regional Education Board

Foreword

The improvement of teacher education has been a central concern since the Southern Regional Education Board began its efforts directed to joint higher education-school reform.

The quality of any higher education program is a combination of many variables. A program that attracts bright students, features exciting faculty, and challenges students with rigorous content is most likely to merit a high rating by anyone's standards. Ideally, the improvement of teacher education would proceed by strengthening all three elements. Realistically, it is seldom possible to move on all fronts at once.

The curriculum of teacher education programs, however, is amenable to direct action by college leaders and faculties. The implications for teacher education reform in this report differ from several current proposals in two important respects: 1) they are based on what students are actually studying as they prepare for teaching careers; and 2) they point toward higher education's obligation to improve what it offers now, instead of superimposing more of what is currently not done well.

The SREB transcript study would not have been possible without the partial funding provided by the National Endowment for the Humanities, the cooperation of the participating universities, and the enormous staff effort of Eva C. Galambos, Lynn M. Cornett, and Hugh D. Spitler.

Winfred L. Godwin
President

Contents

		Page
Foreword		iii
6,000 Student Transcripts, Course by Course		1
Chapter 1	An Overview of the Findings	3
Chapter 2	Implications for Teacher Education	7
Chapter 3	General Education	13
Chapter 4	The Majors	21
Chapter 5	Education Courses	25
Chapter 6	Beyond the Numbers	29
Appendix A	Who Is Included	33

6,000 Student Transcripts, Course by Course

There is a general clamor that teacher education must be improved, but little agreement about how this should be done. There is no shortage of proposals and counterproposals. They range from adding another year to teacher education to doing away with it as it is now known. Few of the proposals are based on a thorough examination of how teachers are actually being prepared.

To document how future teachers are being educated, the Southern Regional Education Board (SREB) has examined, course by course, the transcripts of over 3,000 future teachers. What courses are future teachers taking in college? Do teachers take different academic courses than other students? Does the general education in the first two years lay the necessary foundation for specialization and education courses? What is the division of coursework between the "content" teachers will teach, and "methods" on how they will present the "content"? How relevant are the areas of specialization of the secondary teachers to assignments they are likely to draw in typical high schools?

Seventeen major institutions in the South participated in this study. Transcripts were examined of 3,283 education graduates and 2,760 arts and sciences graduates as a comparison group—all of whom earned a bachelor's degree in 1982-83. (See Appendix A for details on who is included.) For each of the 14 SREB states, the university producing the largest number of teachers is included, as well as three additional universities that wished to participate.

These institutions are large ones, often the "flagship" public university of a state. It is reasonable to conclude that the curriculum in these universities illustrates teacher education in the South. Likewise, the findings in the South may reflect the situation in large public universities with teacher education programs throughout the nation.

The importance of these universities' willingness to have their graduates examined should not be underestimated. In a way, this participation is as significant as the findings of the study, because it is a positive signal of the universities' interest in improving teacher education.

What Follows

The sections that follow are arranged for the reader's convenience. The programs that teachers complete are summarized in Chapter 1, "Overview of the

Findings," followed by the implications of these results for strengthening teacher education programs.

The statistical data concerning the general education of teachers, with comparisons to the arts and sciences graduates, are presented in Chapter 3, followed by an outline of the statistical findings about the academic majors (Chapter 4) and the education courses teachers complete (Chapter 5). The last chapter provides some descriptive impressions about the quality of some of the courses offered.

Some information about who is included in this report is furnished in Appendix A. The full report, *An Analysis of Transcripts of Teachers and Arts and Sciences Graduates,* contains detailed statistical data and methodology, and may be obtained from the Southern Regional Education Board.

Chapter 1
An Overview of the Findings

- Teacher education graduates, as compared to arts and sciences graduates, on average complete:
  - a weaker general education curriculum
  - less coursework in each of the major academic divisions of general education, except for the social sciences
  - fewer courses in the liberal arts at the upper level
  - less coursework in English, mathematics, physical sciences, economics, history, political science, sociology, foreign languages, philosophy, and other humanities
  - more coursework in psychology, applied fine arts, and biology

- Elementary teachers take more coursework in general education than other teachers. The quality and the composition of courses across disciplines, however, are questionable. For example, elementary teachers take fewer hours in English and mathematics combined than they do in the social sciences. Yet, the first two are the areas to which they will give the greatest attention in the elementary grades.

- Teachers take academic courses in sections that are specifically designated for them, apart from other students. Elementary teachers have half of their mathematics credits in courses that the mathematics departments label as "mathematics for elementary teachers."

- A college-level mathematics course is one requiring prior completion of high school algebra I and II and geometry. On this basis, only 22 percent of the mathematics courses teachers take are at the college level, as compared to 53 percent of the work done by the arts and sciences graduates.

- Some students (7 and 11 percent of the teachers and arts and sciences graduates, respectively) earn a degree without ever taking a single mathematics course in college. An additional three percent of the graduates in each group never take a course beyond remedial mathematics (for which the university gave credit). The mathematics course enrollments indicate that large numbers of college students are taking a high school-level program. If what is true in mathematics is also true in other disciplines, the freshman and sophomore years for many students do not represent "higher" education.

- Although communication across the world is now possible instantly, three-fourths of the teachers and one-third of the arts and sciences graduates take no foreign language courses in college.

- Technology permeates economic and social changes. Yet, two-thirds of the teachers and over half of the arts and sciences graduates take no college work in the two sciences that have tremendous relevance to technological change—chemistry and physics.

- Some colleges give students great latitude in how they fulfill the general education requirements. As might be expected, students often follow the path of least resistance, and ferret out courses on the weather or acoustics of musical instruments to meet science requirements. These kinds of courses meet the "letter" of the requirements, but hardly the intent of providing a broad background.

- Three-fifths of teacher and arts and sciences graduates transfer credits from community colleges and four-year institutions. The average transferred credits represent 28 percent of the graduates' coursework in college. Community colleges must become full partners in efforts to tighten the general education of teachers, as well as other students.

- Secondary teachers complete a major in a content area. However, when compared to their counterparts (for example, English education majors and English arts and sciences majors), they take fewer credits in the major and, again, less of their coursework is at the upper level.

- Secondary teachers of science and social science do not usually take courses across the fields as a whole. In the social sciences, their preparation is concentrated in history, with conspicuous absence of work in political science and economics. In the sciences, teachers concentrate their work in biology. Much less attention is given to preparing for chemistry or physics instruction in the high schools.

- Teachers take more hours in education courses than the average certification requirements specified by the Southern states. Elementary teachers take over half again as many credits, while secondary teachers exceed the average certification requirement by approximately two courses.

- The total number of education credits vary considerably among various types of teachers. Special education teachers average the highest number of education credits — 69 hours; music and art teachers average 26 hours.

- Including transferred credits, elementary teachers average 51 hours in education courses. This exceeds the time most arts and sciences students devote to their majors. Only about one-third of the teacher education courses taken involves field applications, although some suggest that education courses should be less theoretical and include more field work or practical applications of theory.

- Elementary teachers have almost two-fifths of their education credits in separate "methods" courses in reading, language arts, mathematics, science, social studies, art, and sometimes even physical education. Secondary teachers take fewer such "methods" courses.

Chapter 2
Implications for Teacher Education

The major conclusion drawn from the analysis of the transcripts of teachers is the need to improve their general education. The liberal education of teachers needs to be at college level, and it should have enough structure to insure that the major disciplines are given sufficient attention.

If college students are not ready to perform college-level work as freshmen and sophomores, then, of course, they must take remedial work, but that should not serve as a substitute for subsequent college-level study. This may result in an extended time to earn a baccalaureate. If the baccalaureate is to regain integrity, those who complete it should master college-level work across the major academic divisions.

The community colleges—where a large proportion of teachers as well as arts and sciences graduates obtain a significant portion of their general education—must become full partners in strengthening the core curriculum.

When general education is strengthened, it is likely to result in improved pedagogy courses too. Once teachers (and other students, for that matter) acquire the ability to communicate in writing and orally with ease and precision, to absorb college-level readings, to reason by using deductive and inductive logic, to evaluate and to compare, then what is offered in the junior and senior years, including education courses, can be at a higher level. Generic courses dealing with the theories of teaching and learning (with exposure to research on these topics) could be substituted for current "methods" courses that revolve around the learning materials the children will use in the schools. Students could then be expected to read and evaluate Plato and John Dewey's philosophies of education rather than memorizing lists of predigested ideas or excerpts in introductory foundations courses.

To some extent the charges recurrently made that education courses are pitched too low reflect general education that does not adequately prepare students to tackle upper level coursework, as well as the problem that teaching tends to attract less able students. While the career rewards for teaching are partially to blame for the latter problem, there is some truth to the "chicken or egg" quandary too. If the level of work expected in education courses were

higher and more challenging, perhaps more bright students would be attracted. While apologists for education point to the higher financial rewards in other fields, such as medicine and law, to explain their problem in attracting good students, there are other occupations that also pay poorly (journalism, for example) and still attract good students.

Education Courses

There is no question that to "put over" content to young children, elementary teachers need a unique set of skills, and that these must be addressed in the education curriculum. High school teachers, too, need collegiate preparation to deal with adolescents and to organize their curriculum, despite the curious contradiction that, under certification rules, high school teachers of 18-year-olds must complete education courses, but college teachers of 19-year-olds are exempt from such regulation.

The question, however, is whether there is a need to spend as many hours in pedagogy courses as teachers now do. Why, for instance, are elementary teachers spending 65 percent more hours in education courses than certification regulations typically require?

There is considerable variation among institutions in the amount of education courses teachers take. For elementary teachers, the average number of education credits for the 17 institutions ranges from 33 to 65 hours; for secondary teachers, from 16 to 39 hours. This evidence indicates that some institutions have consolidated "methods" and other education course content into fewer courses than the average number taken throughout the region.

Although graduates of education programs consistently rate their student teaching courses as the most valuable experience of the programs, why is only one-third of the pedagogy curriculum devoted to field applications? Why are elementary and special education teachers spending so many more hours on their "major," that is, education, than most arts and sciences graduates spend on their academic subjects?

This study did not delve into the "quality" of education courses. However, certain education course titles grab one's attention. For example, in one institution many teachers completed a three-semester-hour upper level course on "Lettering, Posters, and Displays in the School Program."

The average 19 credit hours that elementary teachers spend on "methods" of teaching individual content areas are worrisome. These courses dwell on the techniques and materials for presenting content at the elementary school level. While teachers need to consider appropriate teaching materials, as well as the learning modes for children of different ages, generic methods courses should be available, rather than discrete ones in language arts, mathematics, science, social studies, and physical education. So long as the college curriculum for elementary teachers deals with elementary level content in addition to methods of teaching that content, there will be charges that the teacher education programs are weak.

In rating their education program component, teachers have usually given the foundations courses short shrift. Before they spend time in the schools as teachers, it is quite difficult to create for students an awareness of, and excitement about, the philosophy and history of education, or the socio-cultural and legal issues of education. Over the years, more and more material has been compressed into the introductory courses that deal with these topics, incorporating snatches about many issues. The students tend to memorize lists, but the real implications of the material are as unlikely to be grasped by education majors as theories about the organization of business are by undergraduate business majors before they have been employed. After exposure to the real school situation, and when teachers have gained some maturity through working in the classroom, the content of foundations courses will be more relevant. Therefore, the foundations courses would benefit from being shifted to in-service or to the graduate level.

Length of Teacher Education Programs

The evidence in this study indicates that four years are sufficient for teachers to complete campus work, *if they enter college prepared for college-level work.* If they are not ready for college-level work, remedial courses must first be completed. Since these should not serve as substitutes for the college-level work, the baccalaureate program may extend into five years.

Elementary Teachers

Elementary teachers now devote 69 semester hours to general education, including the academic courses which are designed especially for them. Their total hours by graduation average 137, only two more than the average for arts

and sciences graduates. (College students generally take more than the minimum credits required for graduation, which range from 120-128 semester hours.) If all of the 69 semester hours now spent in general education, plus some of the 19 hours devoted to "methods" courses, were spent in college-level work in English, mathematics, social science, science, and other liberal arts, then elementary teachers could gain a solid liberal education and have at least 49 semester hours to devote to pedagogy courses and physical education (see Table 1). Since the certification requirements in the 14 Southern states, on the average, call for 30 semester hours in pedagogy courses, it might be possible to reduce those 49 hours.

Some have suggested that elementary teachers should complete an academic major, just as secondary teachers do. Proponents of this move point to the benefits of delving at length into a discipline, as is the intent of a major. On the other hand, many elementary teachers instruct children in the early grades over

Table 1

ALTERNATIVE ELEMENTARY TEACHER EDUCATION PROGRAMS

	Current Average Credit Hours	Possible Alternative Credit Hours With Major	Possible Alternative Credit Hours No Major/More Content
General Education	69.3	69*	100
Education Courses			
Methods 18.8		5	5
Field Application 16.4		30	30
Other Courses 14.2			
	49.4	35	35
Physical Education and Transferred Education and/or Physical Education	9.0	5	5
Other Courses	9.2		
Major Specialization	—	30	—
Total Credits	136.9	139	140

*Some of these credits can be assumed to be introductory courses that would apply to a major.

the entire core of the elementary curriculum. They teach as generalists, not specialists. They generally do not teach content above the sixth or seventh grade level in any one discipline. By freeing up the baccalaureate program for elementary teachers from some of the education courses, and by drawing on the courses in the general education component that are introductory to respective majors, it may be possible to pursue a major within the baccalaureate. Certainly, in the alternative, there is enough time within the period it now takes elementary teachers to earn a bachelor's degree to gain more exposure to various academic subjects—provided that general education means college-level work.

Secondary Teachers

The average secondary teacher completes 140 semester hours by graduation, or five hours more than the average arts and sciences graduate not preparing to teach. The secondary teacher must complete the same number of general education credits as other students, the requirements for a major, and enough education courses to qualify for certification. The secondary teachers manage to do this, in some cases even including more education courses than the average minimum certification requirement. However, both the general education component and the major need to be increased if they are to be on a par in number of credits with those completed by most arts and sciences majors.

There is little leeway in the current program to add courses. If secondary teacher preparation is to be completed within a baccalaureate, only two options are available for more emphasis on subject area study—improve the general education component so that it truly represents college-level work; and/or reduce the average 29 hours that secondary teachers devote to education courses.

The Lyndhurst Foundation is currently funding projects in Tennessee whereby arts and sciences graduates with majors in an academic subject spend 10 weeks during the summer on intensive pedagogy instruction. They proceed into paid teaching internships in the fall, serving as teachers with a two-thirds work load. Their classroom performance is monitored by master secondary teachers, and time is set aside for observation of the master teacher in action in his/her classroom. This experimental alternative represents a mid-way solution between the current crowded baccalaureate program for secondary teachers and a master of arts program that adds a full-year of study and student teaching before employment commences.

Beginning Teacher Programs

One of the reforms among the current educational improvements has been the introduction of "beginning teacher" or internship programs. These are designed to give new teachers additional help from experienced teachers during the initial year(s) of provisional certification. Most of the Southern states have instituted these programs, under various names. While in some cases the actual help that beginning teachers receive from master teachers may still be more on paper than in fact, these measures recognize that although teachers have completed teacher education programs, they still need a great deal of assistance on-the-job to gain teaching and classroom management skills. This is to be expected, of course; good teachers do not develop overnight, no matter what theoretical learning has been gained about the craft.

The beginning teacher or internship programs emphasize that while some knowledge may be gained about the art of teaching in campus-based courses, a great deal of additional help is needed in real classrooms and in actual experience before a "finished" teacher is developed. In effect, this is the same need recognized by the advocates of extended five-year teacher education programs. The fifth year is most frequently advocated for the "clinical component."

The real issue is whether the needed extra clinical experience in the classroom should be obtained by a teacher as a paid employee, or by a student-teacher as a college student. Who will be providing most of the training in this clinical component—other teachers in the school, or college faculty traveling to schools from campuses? Is the teacher providing a service while still learning that merits being paid (on a full- or part-time basis), or is the teacher a student who should be paying tuition to a college? These issues need to be addressed as the requisite length of preparation for teachers is discussed.

Chapter 3
General Education

"General education," "liberal education," "the core curriculum" — call it what you will — the intent is to develop a grounding for all college students in the major academic divisions of learning before they specialize further. Despite disagreement among scholars about the specific configuration of undergraduate general education that will produce an "educated" person, most colleges do require students to complete some courses in the five major academic divisions — English, mathematics, science, social science, and other liberal arts.

Teachers especially need a strong liberal arts background. The curriculum in the schools tends to be broad-based. Children, through the middle grades and even into high school, learn across disciplines. Grammar and vocabulary, for example, extend into all subjects. Teachers need an orientation to a variety of arts and sciences to assist children in understanding commonalities and connections between subjects.

The liberal arts or general education of teachers, however, as measured in this study,* is weaker than for arts and sciences graduates. Teachers as a whole take fewer credits than the arts and sciences graduates in each of the major divisions—except in the social sciences. Their advantage in social science stems from coursework in psychology, rather than from history, political science, and the other disciplines within this division.

Teachers take fewer hours in mathematics, English, physics, chemistry, economics, history, political science, sociology, other social sciences, foreign languages, philosophy, and other humanities. The teachers take more hours than arts and sciences graduates in biology, geology, and applied fine arts. Although the difference in the number of credits completed in any one of the disciplines is not large, taken all together the arts and sciences graduates devote approximately half of one semester more than the teachers to becoming broadly educated.

---

*"General education" in this report refers to courses taken at lower and upper levels in the five major academic divisions *after exclusion* of majors in the discipline under consideration. For example, to obtain the data on general education in English, English courses taken by English majors are excluded.

Outside of their majors neither group takes much upper level work in the liberal arts. The teachers complete two upper level courses, while the arts and sciences graduates average three courses. Even in the social sciences, in which the teachers take more total credits than the arts and sciences graduates, the education majors take less of that work at the upper level than the other students.

A remarkable proportion of the teachers finish college without any exposure at all to important disciplines. As shown in Table 2, most teachers never take a course in foreign languages, chemistry or physics, economics, or philosophy.

Most colleges define general education as coursework required to be taken by freshmen and sophomores. If general education in limited to lower level courses in the five academic divisions, the teachers complete approximately 38 percent of their total curriculum at this level, as compared to 45 percent completed by the arts and sciences graduates.

Table 2

PERCENT OF TEACHERS AND ARTS AND SCIENCES GRADUATES WITH *NO* CREDITS IN SELECTED SUBJECTS

	Teachers	Arts and Sciences
Mathematics	7%	11%
Science		
Biology	11	25
Chemistry/Physics	68	54
Other Physical and Earth Sciences	34	41
Social Sciences		
History	6	9
Economics	75	59
Political Science	46	38
Other Liberal Arts		
Philosophy	78	52
Languages	74	31
Applied Fine Arts	40	63
Other Humanities	25	19

Differences in coursetaking patterns between teachers and arts and sciences graduates in the major academic divisions are outlined below.

Mathematics

This discipline lends itself to an evaluation of the level of work required in courses, since course prerequisties are specified. A college-level mathematics course is defined as one that requires prior completion of high school algebra I and II and geometry. Of the average six hours that teachers take in math courses, only one hour represents college-level math; of the average seven hours taken by arts and sciences graduates, half is at college level.

Some graduates earn a bachelor's degree without ever taking a mathematics course in college. Fewer teachers escape mathematics altogether (7 percent) than arts and sciences graduates (11 percent) (see Table 2). For an additional three percent of both groups, the *only* mathematics course taken during college is one that has been labeled as remedial by the four-year institutions from which they earned the diploma. Degree credit was earned for such courses.

The mathematics courses that most teachers complete are either remedial and/or courses designated specifically for teachers or courses below college level.

A description of a typical mathematics sequence designated in college catalogs as pertaining to elementary teachers is:

> *201 Understanding Arithmetic (3 semester hours).* Open only to students seeking elementary certification. Concepts stressed over manipulation. Set and functions, whole numbers, integers, numeration, elementary number theory.
>
> *202 Understanding Elementary Mathematics (3 semester hours).* Prerequisite: 201. Continuation of MAT 201: rational numbers, decimals and real numbers, geometry, measurement, metric system.

One-fourth of all teachers take mathematics courses as described above. Such work represents approximately one-third of the average mathematics taken by all teachers, and one-half for elementary teachers.

A typical description of a mathematics course that is not college level (that is, does not require completion of high school algebra I and II, and geometry) follows:

Basic Concepts of Mathematics (3 semester hours). Designed primarily for liberal arts students not intending to take advanced courses in mathematics. Mathematics is approached from a cultural-historical point of view with emphasis on ideas and their significance rather than on manipulative processes or computations. Topics from number theory, algebra, geometry, topology, and analysis are included.

Five mathematics courses transferred from other colleges (primarily community colleges) show the same problems. There, too, future teachers tend to take a less rigorous level of mathematics than the arts and sciences graduates; many are already segregated into mathematics courses labeled for future teachers.

Science

There is little difference in the total amount of time the two groups devote to science courses; biology is the most popular discipline for both sets of graduates. However, the arts and sciences graduates complete almost twice the number of credits in physics and chemistry as do teachers; teachers take more geology courses. Stated differently, two-thirds of the teachers take no physics or chemistry, and one-fourth of the arts and sciences graduates take no biology. Approximately half of the coursework in science for both groups includes laboratory experience.

English

Arts and sciences graduates take slightly more English credits than teachers. Neither group chooses many upper level English courses, however; 83 percent of the teachers and 74 percent of the arts and sciences group take no upper level English course.

At the senior institutions where they earned their degrees, both groups average one English course that emphasizes writing skills. Since a large proportion of graduates in both groups transferred credits, the second required English course which normally includes composition, is taken at the two-year colleges.

Credit for remedial English is not limited to coursework completed in two-year colleges. For both groups, degree credit for remedial English at the senior institution was noted repeatedly.

Social Sciences

While teachers earn more social science credits generally than the arts and sciences group, the only discipline that accounts for this advantage is psychology. Courses in developmental psychology, which teachers must take, are often offered by the arts and sciences psychology department.

In all the other disciplines (history, political science, economics, sociology, and other social studies, such as geography and anthropology), teachers complete less coursework. They are at a particular disadvantage in political science and economics, in which their courses average half as many as for the arts and sciences graduates.

Other Liberal Arts

The greatest discrepancy between the two groups is found in this division of the curriculum, which includes applied fine arts, foreign languages, philosophy, music and art appreciation and history, classics, and religion. The teachers have 11.4 credits in these "other liberal arts" combined; the arts and sciences graduates have 17.8.

At least three-fourths of the teachers take no philosophy and no foreign language courses. They do take more applied fine arts courses, often in sections offered primarily for teachers. They have less exposure to what is grouped as "other humanities," which includes appreciation and history of the fine arts.

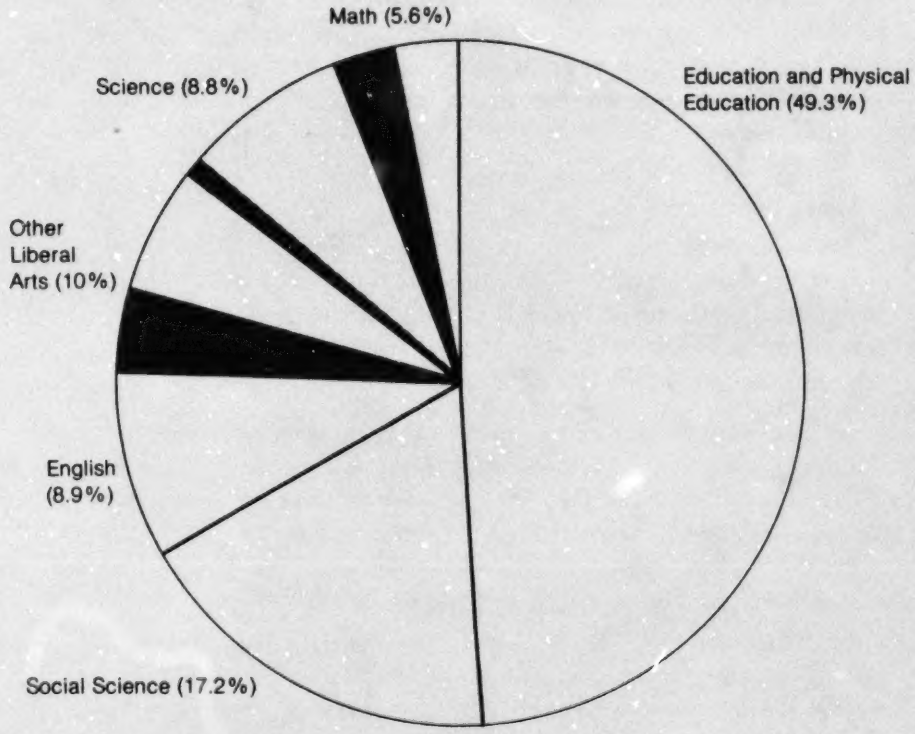
General Education—Elementary Teachers

From the perspective of credit hours, the elementary teachers complete more general education than other teachers—69.3 hours as compared to an estimated 57 for all other teachers. Yet, there is evidence that the rigor of their general education may be less than that of other teachers. For example, of the total mathematics courses taken by the teachers for the early grades, half represents courses designed specifically for them (see Figure 1).

Although elementary teachers generally match arts and sciences graduates in terms of the number of credits earned in the liberal arts, there are notable differences in the programs for the two groups. The arts and sciences graduates are more likely to choose subjects such as foreign languages and political science. The elementary teachers gravitate toward applied fine arts and

Figure 1

TYPICAL PROGRAM FOR ELEMENTARY TEACHERS



■ Academic work in sections designated for teachers.

□ Regular academic courses.

psychology, and spend half of a full semester in academic courses designated primarily for them.

The content on which elementary teachers will spend the majority of their efforts with elementary school students encompasses language arts and arithmetic. Yet, as college students these teachers spend less time in academic courses in these two disciplines combined than in social science.

Loose General Education Requirements

It is not surprising that students ferret out unusual courses to meet the "letter of the law," but hardly the intent of general education requirements across the major academic divisions. Some universities offer sufficient latitude to permit such choices.

A careful analysis of the catalogs of the 17 institutions in the transcript study reveals that six of them may be characterized as "prescriptive." They are fairly specific about listing the courses students may take to meet the distribution requirements in each of the five major academic divisions. At these six institutions, the list of permitted courses to fulfill the division requirements is not very long.

At the other extreme are eight "free choice" institutions that are not specific about course requirements. If courses are listed, the choice may be so wide as to include all courses in a discipline from 100 to 299.* Another characteristic of the "free choice" group is that mathematics, foreign languages, philosophy, or various combinations of these disciplines may be interchanged to meet the divisional requirement. Between these two types are three institutions that do circumscribe student choice to some extent, but not as much as the "prescriptive" institutions. One institution, for example, specifies the courses that satisfy divisional requirements, but the list is long. The nine quarter-hours in social sciences include not only the introdutory courses in each of the traditional social sciences, but also environmental problems, family relationships, and criminology. Since the latter three are offered by three different departments, technically and conceivably they meet the social science requirements.

*Most institutions designate freshman and sophomore courses at the 100 and 200 levels, with 300 and 400-numbered courses representing upper level work.

Seven of the seventeen institutions clearly specify that mathematics must be taken for any type of degree, but only four of these limit such math to courses that require prior completion of high school algebra I and II and geometry. In others, mathematics is mentioned as an option, along with other disciplines such as languages, computer sciences, or even history of science, for the bachelor of arts. In the absence of universal requirements in mathematics, it is not surprising that the average number of hours and the level of mathematics taken by the graduates in this study are low, and that some graduates take no mathematics whatsoever.

The institutions tend to be more prescriptive with regard to science. All students must take science courses. Only five institutions, however, specify that both biological and physical sciences are to be taken. This explains why so few students take chemistry or physics.

All the institutions require completion of some courses within the social sciences, but only three specify that U.S. history be included. These same three also require a course in U.S. government. An additional institution specifies that the divisional requirement in history must include a course in Western history. The lack of specificity in how social science divisional requirements are to be met explains why half of the teachers and over one-third of the arts and sciences graduates in the transcript study took no political science course—the discipline in which one would expect U.S. government to be covered.

Five of the seventeen participating institutions require completion of foreign language study for a bachelor of arts. The finding that one-third of the arts and sciences graduates and three-fourths of the teachers in this study took no foreign language mirrors catalog requirements. When languages are not required for graduation, enrollments are miniscule.

Chapter 4
The Majors

Secondary teachers tend to be weaker than arts and sciences graduates in their "content" preparation, or majors. They take fewer hours in the major, and less of that work is taken at the upper level.

On the average, the teachers majoring in mathematics, English, fine arts, and languages (for whom direct comparisons with the arts and sciences counterparts are possible) complete one or two fewer courses in their majors than the other group (see Table 3).

In some states teachers prepare for two areas of certification, for example, mathematics and science, or mathematics and physical education. The necessity to cover two fields may slight content in both fields or in the second field, if that consititutes a minor. In Table 3 only those teachers are included whose major or whose first-named area of certification falls within that subject. Thus,

Table 3

COURSEWORK IN MAJORS
Average Hours, and Percent at Upper Level

	Teachers		Arts and Sciences	
	Average Hours in Major	Percent at Upper Level	Average Hours in Major	Percent at Upper Level
High School Subjects:				
Mathematics	33.5	45%	36.8	46%
English	38.2	57	43.6	64
Science	49.4	31	39.3–55.8*	47–62*
Social Science	56.6	39	26.4–38.3*	61–75*
Languages	42.1	60	48.5	48
K-12 Subjects:				
Fine Arts	57.9	42	64.5	48
Health/Physical Education	51.0	69	—	—

*Range represents variation depending on the specific major within the sciences and social sciences.

the content preparation of all teachers who are assigned to teach a given subject would be less than that shown if the teachers with a second certification area in that field or minor had also been included.

Comparisons for the science and social science majors are not as straightforward. Courses in all the sciences, regardless of the teacher's specific major within science, are included for teachers. This is important since high school science teachers may be called upon to teach in more than one discipline. The same approach is used for social science teachers. For the arts and sciences graduates, the counted coursework included in Table 3 is limited to discrete social science disciplines, or to all courses either in the biological sciences or in the physical sciences, depending on the graduate's major.

The differences between teachers and arts and sciences graduates in upper level coursework are most notable in the sciences and social sciences. For science teachers, only one-third of their science courses are at the junior-senior level. Most arts and sciences graduates, however, take at least half of their science courses at the upper level.

Social science teachers take 39 percent of their coursework at the upper level; for the arts and sciences graduates, this ranges from 61 to 75 percent, depending on the specific major.

How diversified are science and social science teachers' programs over the various disciplines in the academic division? On the average, science teachers take half their work in biology, one-third in chemistry-physics combined, and the rest in geology and other physical sciences. Two-thirds of the teachers take over 50 percent of their science major in biology courses; only nine percent concentrate the same effort on chemistry and physics. Obviously, too many science teachers specialize in biology, while too few concentrate in the physical sciences.

The lack of attention to the physical sciences, not only on the part of all teachers but even for science teachers, bodes ill for a society that stakes its role in the world economy on high technology. Physics and chemistry are the two disciplines that are fundamental to comprehending technological developments. If teachers do not obtain enough college coursework in these disciplines, they are unlikely to stimulate interest among their students in these subjects.

The average social science teacher concentrates 40 percent of the social science credits in history, with political science and psychology (including educational psychology) at approximately 15 percent each.

One-fourth of the social science teachers either take no political science course or less than a two-course sequence; one-third of them totally avoid economics. Yet, these two social sciences cover U.S. government and the fundamentals on how the U.S. economy works—both topics in the normal high school social studies curriculum.

The content preparation of science and social science teachers illustrates the dilemma of balancing breadth versus depth. If high school teachers are supposed to teach across the broad field (for example, biology and physics, or history and civics), they need coverage across various disciplines. The majority of high schools in the 1980s have less than 1,000 students. They are too small to assign specialists in one field to that subject for most class periods in a day. However, to gain breadth, high school teachers will be more likely to take introductory courses in various disciplines. This makes it more difficult to obtain depth in any one subject, the pursuit of which is considered an important aspect for the intellectual development of students during an undergraduate program.

Health/Physical Education and Fine Arts Majors

Teachers preparing for health/physical education certification average 51 hours in that major. This is more than mathematics, English, science, and language teachers devote to their majors. Only social science and fine arts teachers devote more time to their majors than the physical education majors, who also amass a considerably higher proportion of their major credits in upper level courses (69 percent) than is the case for teachers of academic subjects.

The higher percentage of credits that health/physical education majors earn at the upper level should be evaluated in light of the course titles of some such upper level work: "Sports Officiating: Theory and Practice of Baseball (or some other sport)," "Standard First Aid and Personal Safety," "Coaching Track and Field," etc.

Although these teachers devote a considerable amount of time to their major, this does not constitute an especially high proportion of their total undergraduate program (35 percent). Many are certified in a second field, which contributes to the fairly high number (145) of total credits.

The music, drama, and art teachers average 58 hours in all applied fine arts courses combined, representing 38 percent of their undergraduate programs. The arts and sciences fine arts majors devote even more time to their specialties—almost half of their entire program. Even these numbers for teachers and arts and sciences fine arts majors understate the extent of their specialization, since "fine arts" in this context refers to applied work. Many fine arts majors earn additional credits in the history and appreciation of music, art, and drama, and music theory, which are included as general education in the humanities and not within the fine arts major.

Chapter 5
Education Courses

The number of credits teachers complete in the colleges of education varies considerably, depending on the type of certificates they seek. While on the average they earn 43 hours in education courses, the range is from 69 for special education teachers to 23 for health/physical education teachers. The education credits summarized in Table 4 understate the total, since they do not include educational psychology for half of the institutions, where this course is taught in the department of psychology. Nor are other academic courses included that teachers take in sections reserved for them, such as "mathematics for elementary teachers."

Total coursework in education-related courses (including the colleges of education, educational psychology in psychology departments, and academic

Table 4
EDUCATION CREDIT HOURS

	All Teachers	Elementary	Secondary	Special Education	Music/ Art/Drama	Health/ Physical Education
Average Education Hours Earned at Participating Institution*	42.4	49.4	28.3	69.3	26.3	23.0
Average Education Hours Transferred from Other Colleges	1	1.5	0.9	NA	NA	NA
Education Hours as Percent of Total Credits	30%	37%	21%	48%	17%	16%

*This does not include educational psychology in half of the institutions, where the course is taught in the psychology department.

courses designated for teachers) averages 49 hours for all teachers and 58 hours for elementary and early childhood teachers, or 35 percent and 42 percent of total credits, respectively.

Secondary teachers take considerably fewer education hours than most other teachers. Special education teachers take a remarkable number of hours in education—69, not counting the additional educational psychology and academic courses for teachers taught outside the colleges of education.

Education credits are divided into three categories: "methods," "field applications," and "other" education courses (see Table 5). The courses in the "methods" area are those that deal with the techniques and curriculum materials of teaching a given subject, such as language arts or science. These courses, offered in the colleges of education, generally address content on the level of the age group to be taught and expose the teachers to texts, workbooks, exercises, experiements, etc. that are appropriate for teaching various age

Table 5

EDUCATION HOURS, BY TYPE OF EDUCATION COURSES*

	All Teachers	Elementary	Secondary	Special Education	Music/ Art/Drama	Health/Physical Education
"Methods" Courses	13.0	18.8	7.5	17.2	6.1	3.5
Practicums and Student Teaching	15.4	16.4	11.8	23.7	11.5	11.2
Other Education Courses**	14.0	14.2	9.0	28.4	8.7	8.3

* This does not include education credits transferred from other institutions.

** This does not include educational psychology credits in half of the institu... ns, where the courses are taught in the psychology department.

groups. The elementary education teachers take almost 19 hours in these "methods" courses, since they usually enroll in separate courses for language arts, reading, arithmetic, social studies, science, fine arts, and even physical education.

The "field applications" are courses that provide an opportunity to observe in classrooms, as well as the student teaching experience. Approximately one-third of the education curriculum provides such "clinical" exposure.

Exceeding Certification Requirements

Teachers take considerably more education courses than the state certification regulations require. On the average, the 14 Southern states call for 30 education credits for elementary teachers and 22 for secondary teachers. The elementary teachers exceed the requirements by at least 65 percent; the secondary teachers, by 29 percent.

There is considerable variation among institutions in the average education credits teachers take. For the 17 major institutions, the averages for elementary teachers range from 33 to 65 hours; for secondary teachers, from 16 to 39 hours. Some of this difference results from variations in state regulations, but additionally, some universities call for a larger pedagogy sequence than others. The concentration in education courses for elementary and special education teachers represents their major. The education courses for these two groups of teachers represent 37 and 48 percent, respectively, of their total college credits.* These teachers are devoting a greater proportion of their programs to pedagogy instruction than secondary teachers devote to their academic majors, or arts and sciences graduates typically spend on their concentration.

A comparison to a study of teacher education programs over 20 years ago by James Koerner (reported in his 1961 book, *The Miseducation of American Teachers),* leads to the conclusion "how little has changed." He questioned the liberal education of teachers and deplored the fact that many teachers took no work in mathematics or in foreign languages. He noted that teachers were taking substantially more credits in education courses than state requirements called for.

---

*This is without counting the academic courses designated for teachers or the educational psychology courses when taught in psychology departments.

Chapter 6
Beyond the Numbers

Statistics alone do not convey the full dimension of the problems associated with the baccalaureate programs—in the arts and sciences as well as in education—completed by some of the graduates in the transcript study. They fail to convey instances when students repeat courses, sometimes more than once, and finally obtain course credit with a grade that is still only a "D." Other students fail a subject and then manage to obtain a "B" or "C" in a similar course at another college, often a community college, and transfer this as late as their senior year. Nor do statistics convey the difficulty some college students encounter in general education courses, but who then earn higher grades through their ingenuity in "shopping around." The following examples are illustrative of these and other problems that were uncovered in the transcript study.

Difficulties in Passing Mathematics

Ann, an arts and sciences major in psychology, made an "F" twice in a junior college course labeled "college mathematics." She took "Introduction to College Mathematics" at the senior institution and earned a "B." No additonal mathematics courses were taken.

Joe, a political science major, took developmental Mathematics II in junior college and earned a "D." He then took "Intermediate Algebra" at the junior college and again made a "D." The junior college catalog's description of the latter course reads: "For those students who find college algebra too difficult." No other mathematics course was taken at the senior institution.

Bill, an elementary education major, took a course called "real number system" at the junior college and failed the course. He took the "real number system" at the senior institution and received a "B." He then took "Mathematics for Elementary Teachers" twice—earning a "D" the first time and a "B" the second time around. No other mathematics course was taken.

Instances of students taking the required mathematics at a different college after repeated failures were noted on a number of transcripts.

Tony, a political science major, took college algebra three times at a junior college. He made a "D" the first time, and failed the last two times. Then he took "mathematics analysis" at a small private four-year institution and received a "C" before transferring to the senior institution.

Edward, an elementary education major, took "Basic College Mathematics" at a junior college and received an "A." He then took "Elementary Mathematics for Teachers" at the senior institution twice, failing it both times. He returned to the junior college the summer before graduation and took "Mathematics 101" and received an "A." He took a mathematics methods course for elementary teachers and received a "C."

Mike, eligible for certification as a music teacher, did not fare well in courses outside music performance and education. Music theory and history courses repeatedly earned "D's," "F's," and withdrawals. He took music history courses a total of seven times, receiving five "F's" one "D," and a "withdrew failing." He took one mathematics course at the senior institution, "Math Insights," and received an "F." He took basic mathematics at a junior college and received a "C." He attempted an English composition course six times, receiving two "F's," one "D," one "C," one "incomplete F," and one "incomplete." He received another "incomplete F" in an upper level English course. He took 10 education or music education courses, receiving one "A," seven "B's," one "C," and one "passing" grade.

Illustrative Inconsistencies

Some students "shop around for courses" after repeated failures. Some who become teachers do very poorly in content courses, but raise their grade point average through the education courses.

Erica, a university student majoring in social science, earned credit for the same course more than once. She took first-year Spanish and received an "incomplete" in spring of 1978. She took it again in winter of 1980 and received five hours credit with a grade of "C." In spring of 1980 she took Spanish II and withdrew. In fall 1981 she audited Spanish I and in spring of 1982 took Spanish I again and received a "C" and five hours credit. She subsequently took Spanish II and III and received 10 hours additional credit.

Drew, a mathematics education major, earned an "A" or "B" in only one-third of the mathematics sequence, with "D," "F," and "W" in 30 percent of the courses. For 16 education courses, however, he received "A," "B," or "Pass" three-fourths of the time.

Beverly, a science education major, took only one mathematics course, "College Algebra." She attempted 44 courses in the sciences and received 22 "D's," "F's," or withdrawals. She attempted the first quarter of organic chemistry twice, the second quarter three times, before passing; she took the third quarter three times, failing each time. She attempted "Introduction to Physics" four times, finally passing with a "C" her last semester. This student graduated "with honors."

General Education

The process of coding more than 6,000 transcripts produced signals that the general education component for many students (arts and sciences and education majors) leaves something to be desired. Some courses on the transcripts stirred one's curiosity. For example, given the general disinterest in physics among teacher graduates, why in one institution were students earning credits in physics courses? Upon inspection, it turned out to be a course on "Acoustics of Musical Instruments." In another institution, an unusually large number of teachers demonstrated an interest in a course offered in the Aviation Management Department, "Meteorology," which focuses on the effects and phenomena of weather. Do such courses represent the desired foundation in science to fulfill general education requirements?

Astronomy is a frequent choice at those institutions whose distribution requirements are not tightly prescribed. While astronomy can be a very rigorous course, when it is taken instead of physics and chemistry, a cynic might explain its popularity on the basis of the opportunities it provides students for star gazing. At one institution many students completed a 400-level biology course. This turns out to be the course: "Man and His Environment: The interaction of man and the environment, emphasizing the intimate relationship of the biosphere to man. Not available for biology major credit." This may be an important, and possibly rigorous, non-lab course, but does it represent a foundation in science for the purpose of meeting general education division requirements?

The interest among teachers in anthropology courses produces the following frequently chosen offerings: "Southern Appalachian Folk Culture" in one institution, and "Understanding Other Cultures" in another. The former course is offered by a university located in the Appalachians, so that students would be expected to have some prior knowledge of the culture. The interest in other cultures complements the need for teachers to understand the different

backgrounds of pupils they will teach. Yet, one wonders whether these topics are more important than American government or principles of economics—social science courses taken less frequently by teachers.

English courses could not be ranked by levels of content. But, some transcripts signal that there may be problems in this academic division of general education similar to those found for mathematics. The high school curriculum in the last three years has been tightened significantly so that drama and film studies may no longer count to meet the English requirement for graduation. The transcripts of some college students, however, indicate that for them courses in film study satisfy a part of the English division requirements for a bachelor's degree.

Appendix A
Who Is Included

The 17 institutions that participated in this transcript study are:

Appalachian State University (North Carolina)
Arkansas State University
Auburn University (Alabama)
East Texas State University
Eastern Kentucky University
Florida State University
James Madison University (Virginia)
Louisiana State University
Marshall University (West Virginia)
Southwest Texas University
Towson State University (Maryland)
University of Georgia
University of Kentucky
University of North Carolina at Chapel Hill
University of South Carolina
University of Southern Mississippi
University of Tennessee

Non-classroom specialists and vocational teachers were excluded from the study. Additionally, to hold the study within manageable bounds, only one-half of the elementary and physical education teachers were included. With those exceptions, this report includes 3,283 graduates who earned a baccalaureate degree from the participating institutions in 1982-83 and became eligible for teacher certification. The following indicates the number of teachers in the certification areas analyzed:

1,251 early childhood and/or elementary
716 secondary academic
524 special education
404 fine arts K-12
355 physical education

The comparison group represents a random selection of 2,760 graduates distributed in proportion to the numbers who completed their baccalaureates in the various arts and sciences at the participating institutions in the same year as the teachers.

Transferred and Total Credits

Approximately three-fifths of both the teachers and arts and sciences graduates transferred credits from other colleges to the institution from which they graduated.

On the average, they transferred 28 percent of the credits they eventually earned, with no differences between teachers and arts and sciences graduates.

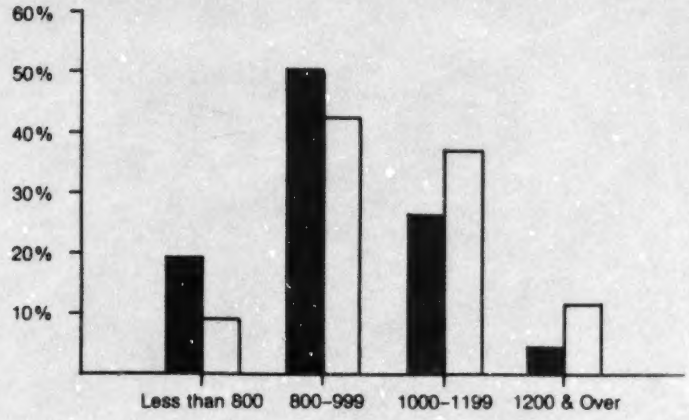
The total credits at the time of graduation average 135 for the arts and sciences graduates, as compared to 142 for the teachers. Elementary teachers, however, earn practically the same total hours as the arts and sciences graduates — 137.

SAT and ACT Scores

SAT or ACT scores were submitted for only one-third of the graduates in this study. Their scores bear out, as has frequently been noted, that test scores are lower for incoming freshmen intending to major in education relative to other fields. The SAT average for these teachers is 70 points lower than that of the arts and sciences graduates; the ACT scores are 3 points lower. The differences in scores for the two sets of graduates reflect the higher concentration of teachers at the lower scores, and the smaller proportion of teachers at the upper scores (see Figure 2).

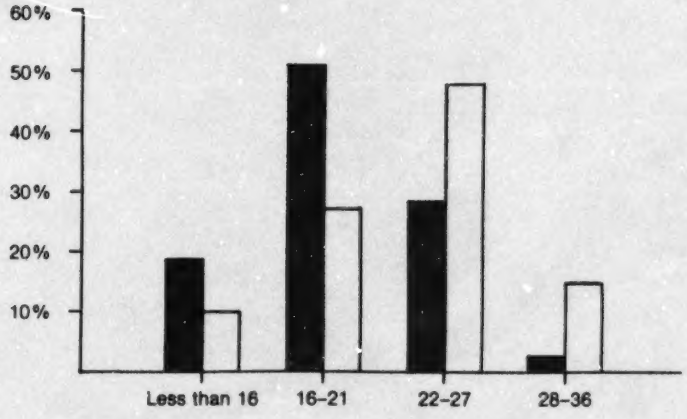
Figure 2

Distribution of SAT Scores*



*SAT score range is from 400 to 1600.

Distribution of ACT Scores†



†ACT scores can go as high as 36.

■ Teachers
□ Arts and Sciences Graduates

ORDER FORM

Copies of the technical report on the SREB study, ***An Analysis of the College Curriculum of Teachers and Arts and Sciences Graduates,*** are available from the Southern Regional Education Board. This 180-page technical report provides a detailed analysis of the findings, and includes 36 tables comparing the coursework taken by more than 6,000 teachers and arts and sciences graduates in the 17 participating Southern universities. Payment of $6.50 per copy (includes postage and handling) must accompany orders.

Please send _____ copies of ***An Analysis of Transcripts of Teachers and Arts and Sciences Graduates***

Payment of $_____ (at $6.50 per copy) is enclosed.

Name: _____

Address: _____

_____

_____

Ordered by: _____ Date: _____

MAIL TO: Southern Regional Education Board
1340 Spring Street, N.W.
Atlanta, Georgia 30309